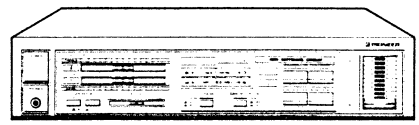
PIONEER

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS



ORDER NO.
ARP1110-0

STEREO AMPLIFIER

SA-770(BK)
SA-770

MODEL SA-770 [BK] COMES SIX VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Applicable model		Power requirement	Destination
	SA-770 [BK]	SA-770		
HE	○	○	AC220V, 240V (switchable)	European continent
HB	○	○	AC220V, 240V (switchable)	United Kingrom
S	○	–	AC110V, 120V, 220V 240V (switchable)	General market
YP	○	–	AC240V only	Australia
HEZ	○	○	AC220V, 240V (switchable)	West Germany
KC	○	–	AC120V only	Canada

- This service manual is applicable to the HE type.
- As to the other types, please refer to additional service manual.

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1. SPECIFICATIONS

Amplifier Section

Continuous average power output is 50 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.2% total harmonic distortion.

Continuous Power Output (both channels driven)
- T.H.D. 0.2%, 1 kHz, 8 Ω ..... 60 W per channel
- T.H.D. 0.2%, 20 Hz to 20 kHz, 8 Ω ..... 50 W per channel

DIN, Continuous Power Output at 1 kHz (both channels driven)
- T.H.D. 1%, 1 kHz, 8 Ω ..... 62 W per channel

Input (Sensitivity/Impedance)
- PHONO ..... 2.5 mV/50 kΩ
- TUNER, CD/VIDEO, TAPE PLAY ADAPTOR IN ..... 150 mV/50 kΩ

Phono Overload Level (T.H.D. 0.01%, 1 kHz) ..... 150 mV

Output (Level/Impedance)
- TAPE REC, ADAPTOR OUT ..... 150 mV/2.2 kΩ
- Headphone ..... 67 mV/8 Ω

Frequency Response
- PHONO (RIAA Equalization) ..... 20 Hz to 20 kHz ±0.5 dB
- TUNER, CD/VIDEO, ADAPTOR IN, TAPE PLAY ..... 10 Hz to 70 kHz $^{+1}_{-3}$ dB

Tone Control
- BASS ..... ±10 dB (100 Hz)
- TREBLE ..... ±10 dB (10 kHz)

Loudness Contour (Volume control set at −40 dB position)
- 100 Hz ..... +6 dB
- 10 kHz ..... +3 dB

Hum and Noise (IHF, short circuited, A network)
- PHONO ..... 72 dB
- CD/VIDEO, ADAPTOR IN, TUNER, TAPE PLAY ..... 102 dB

Hum and Noise (DIN, continuous power /50 mW)
- PHONO ..... 68 dB/60 dB
- CD/VIDEO, ADAPTOR IN, TUNER, TAPE PLAY ..... 84 dB/62 dB

Speker Load Impedance
- A or B ..... 6 — 16 Ω
- A + B ..... 6 — 16 Ω

Miscellaneous

- European model ..... a.c. 220 V ~, 50/60 Hz
- U.K., Australian models ..... a.c. 240 V ~, 50/60 Hz
- Canadian models ..... AC 120V, 60 Hz
- Other destination models ..... ~AC 110 V/120 V/220 V/240 V (switchable), 50/60 Hz

Power Consumption
- European, U.K., Australian models ..... 400 W
- Canadian model ..... 290 VA (CSA)
- Other destination models ..... 140 W

Dimensions ..... 420 (W) x 98 (H) x 273 (D) mm
16-1/2 (W) x 3-7/8 (H) x 10-3/4 (D) in

Weight (without package) ..... 5.6 kg (12 lb 6 oz)

Furnished Parts

Operating Instructions 1

NOTE:
- *Specifications and design subject to possible modification without notice due to improvements.*
- **Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Claims for Amplifier.*

2. FRONT PANEL FACILITIES

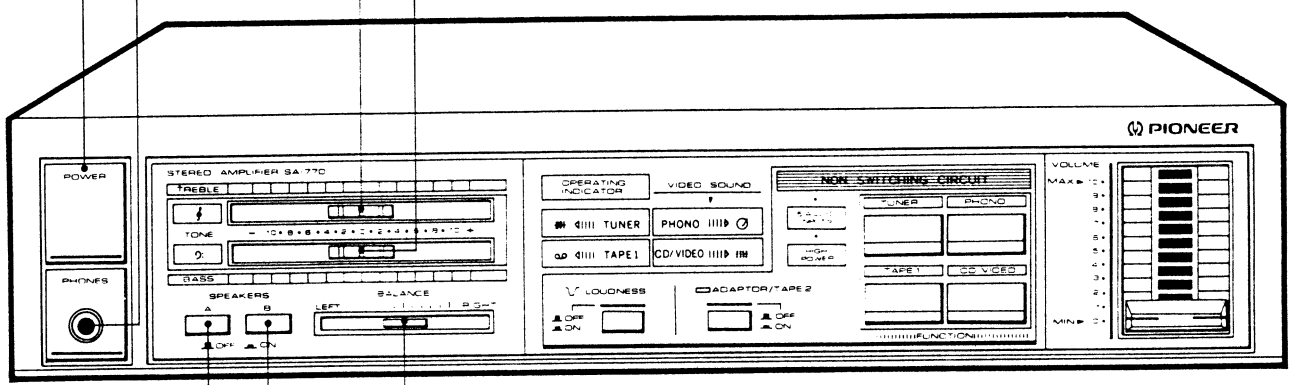
Indications on the actual unit may differ from those in the illustration. However, operating procedures are the same.

POWER switch
Press to turn power to the unit ON and OFF.

PHONES jack
When using headphones, insert their plug into this jack.

TREBLE tone control
Use to adjust the high-frequency tone.
The central "0" position is the flat (normal) position. When moved to the right, high-frequency tones are emphasized; when moved to the left, high-frequency tones are de-emphasized.

BASS tone control
Use to adjust the low-frequency tone. The central "0" position is the flat (normal) position. When moved to the right, low-frequency tones are emphasized; when moved to the left, low-frequency tones are de-emphasized.



SPEAKERS A selector switch
Use this switch to listen to the speaker systems connected to the SPEAKERS A terminals.
[ON] – Depressed position: Sound is head from speaker systems.
[OFF] – Released position: No sound is heard from speaker systems. Set to this position when listening with headphones.

BALANCE control
Should normally be left in the center position. Adjust balance if the sound is louder from one of the speakers. If the right side is louder, move toward the LEFT position and if the left side is louder, move toward the RIGHT position.

SPEAKERS B selector switch
Use this switch to listen to the speaker systems connected to the SPEAKERS B terminals.
[ON] – Depressed position: Sound is heard from the speaker systems.
[OFF] – Released position: No sound is heard from the speaker systems. Set to this position when listening with headphones.

NOTE:
When the speaker system is connected to only one speaker terminal (A or B) and both A and B selector switches are ON, there will be no sound. Turn ON only the selector to which the speaker system is connected.

Indicators

The indicators light to show the positions of the FUNCTION switches.

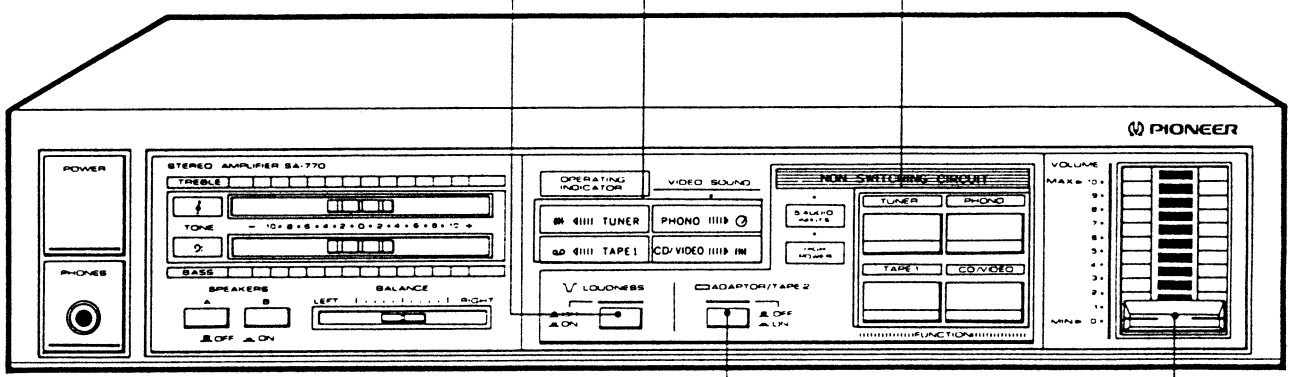
LOUDNESS switch

Use when listening at low volume levels.
[OFF] — Released position: Should normally be left in this position.
[ON] — Depressed position: Boosts low and high frequencies to give added punch to playback even at low volume.

FUNCTION switches

Use to select playback source.
[PHONO] — Press when listening to record playback on a turntable.
[TUNER] — Press when listening to AM or FM broadcasts with a tuner.
[CD/VIDEO] — Press when listening to programs from a component connected to the CD/VIDEO terminals.
[TAPE 1] — Press when listening to tape playback with a tape deck.

NOTE:
Function switches should be pressed firmly; otherwise, all the function indicators will light, and no output will be produced. If this occurs, press the desired function switch again.



ADAPTOR/TAPE 2 switch/indicator

Use when there is an adaptor component (graphic equalizer, etc.) or tape deck connected to the ADAPTOR/TAPE 2 terminals.
[OFF] — Released position: When not in use.
[ON] — Depressed position: When using the adaptor component or listening to the tape deck.

NOTE:
When no connections are made to the ADAPTOR/TAPE 2 terminals, or when they are not in use, be sure to set this switch to the OFF position. (No sound will be heard if it is set to the ON position.)

VOLUME control

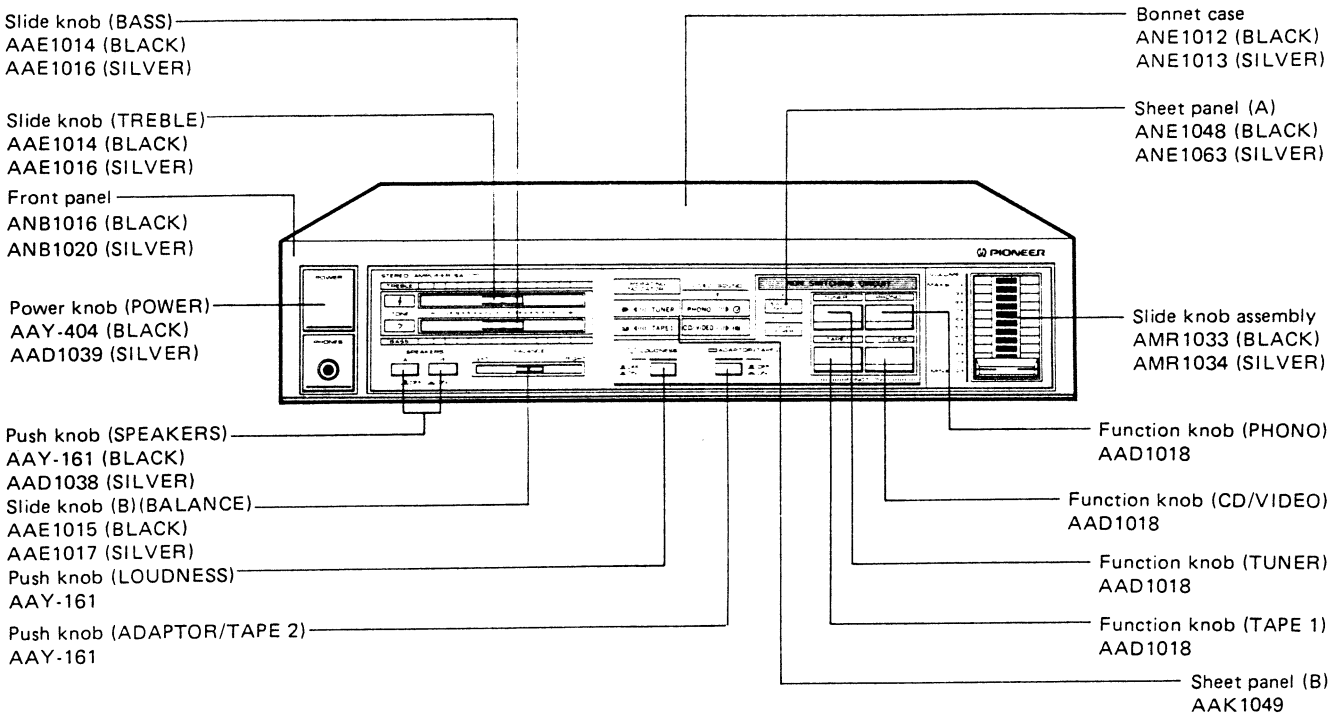
Use to adjust volume level.
Move up to increase volume.
Move down to lower volume.

3. PARTS LOCATION

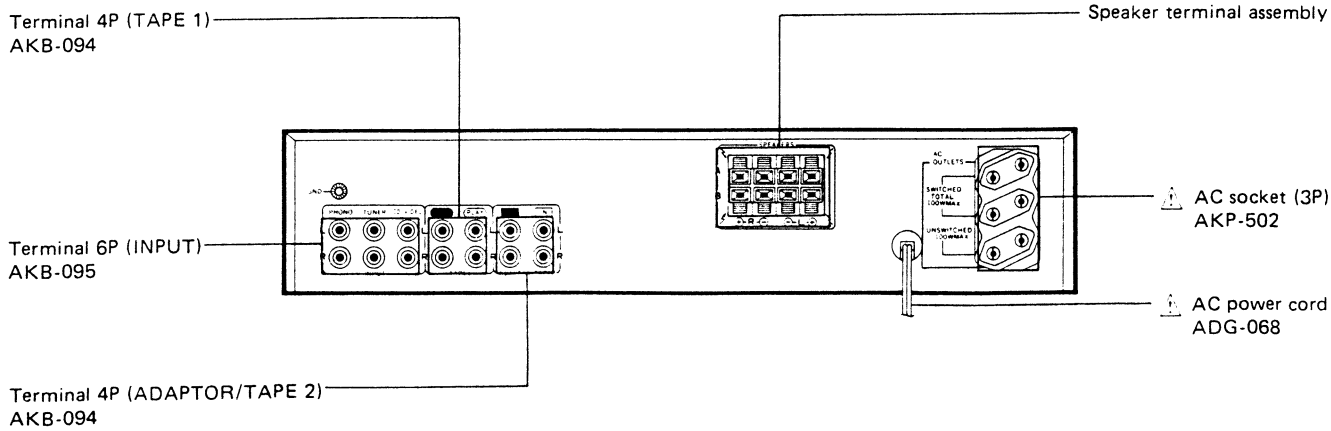
NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

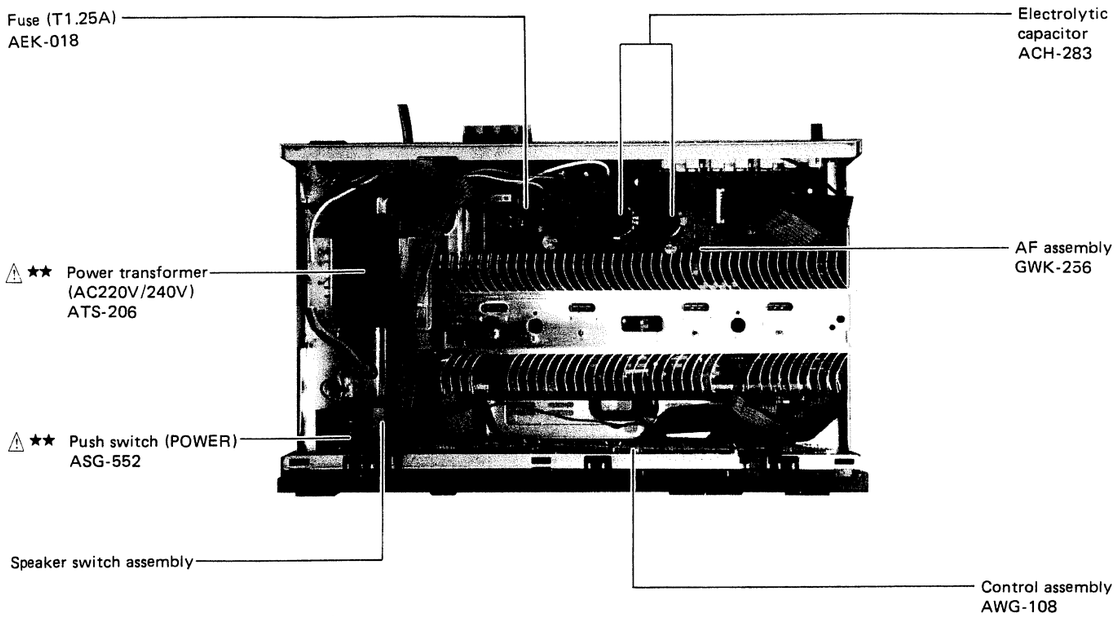
Front Panel View



Rear Panel View

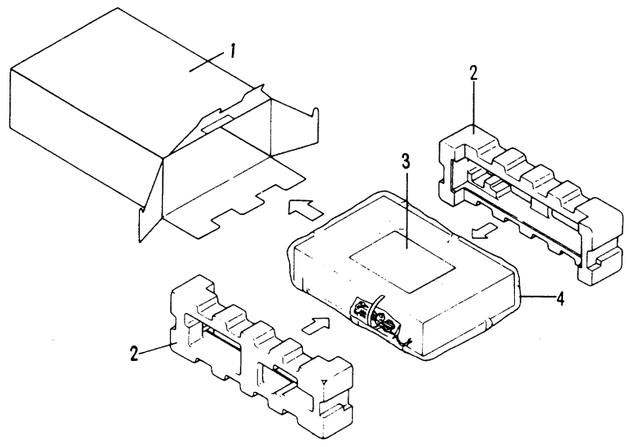


Top View



4. PACKING

Mark	No.	Part No.	Description
	1	AHD1032	Packing case (BLACK)
		AHD1053	Packing case (SILVER)
	2	AHA-340	Front rear pad
	3	ARE1006	Operating instructions (English/German/French/ Italian)
	4		Polyethylene sheet



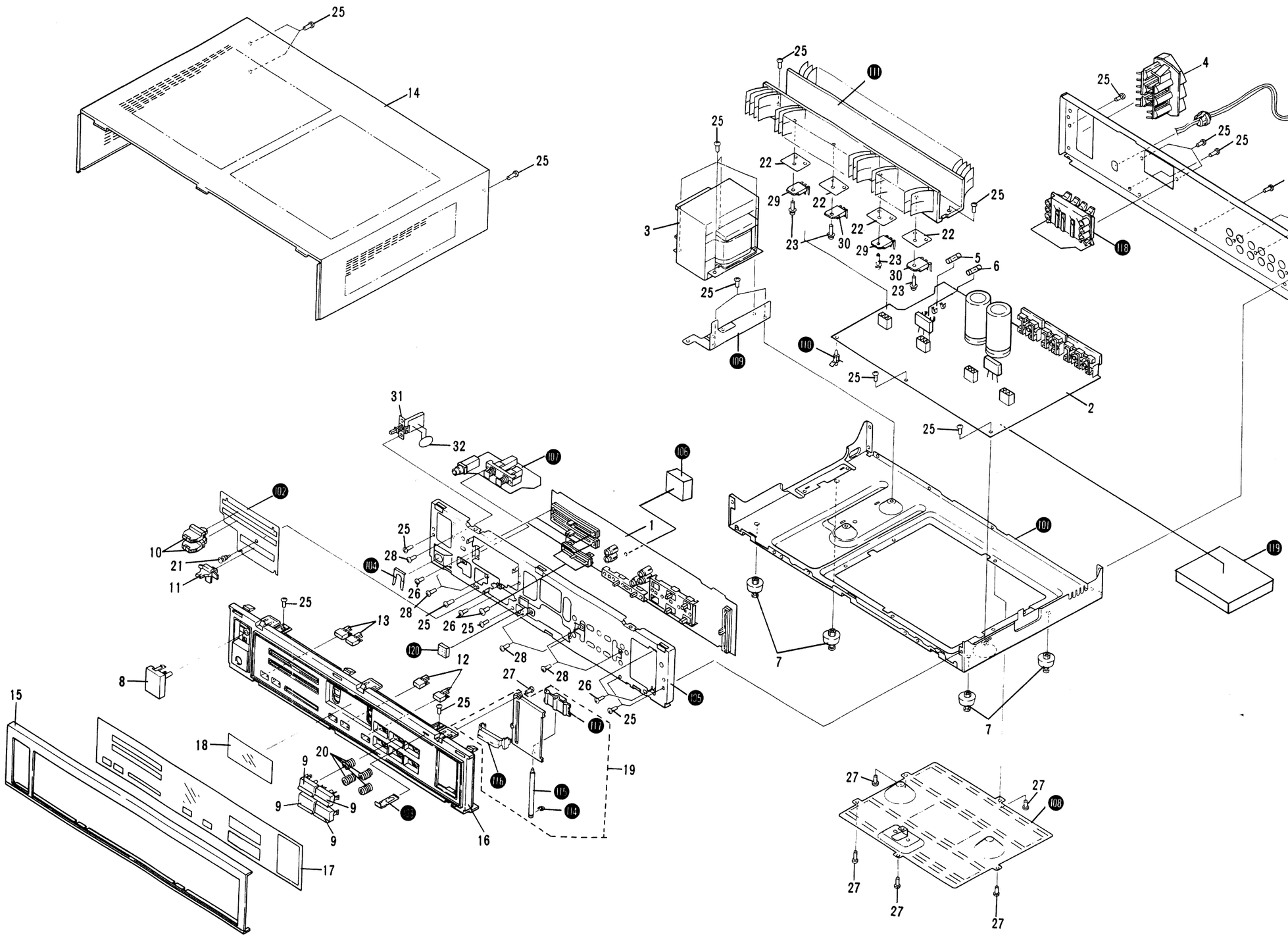
5. EXPLODED VIEWS

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Parts List

Mark	No.	Part No.	Description
	1	AWG-108	Control assembly
	2	GWK-256	AF assembly
⚠ ★	3	ATS-206	Power transformer (AC220V/240V)
⚠	4	AKP-502	AC socket (3P)
⚠ ★★	5	AEK-018	FU1 Fuse (T1.25A)
⚠ ★★	6	AEK-403	FU2 Fuse (T2.5A)
	7	AEC-784	Leg assembly
	8	AAY-404	Power knob (POWER) (BLACK)
		AAD1039	Power knob (POWER) (SILVER)
	9	AAD1018	Function knob (PHONO/ TUNER/TAPE 1/CD/ VIDEO)
	10	AAE1014	Slide knob (BASS, TREBLE) (BLACK)
		AAE1016	Slide knob (BASS, TREBLE) (SILVER)
	11	AAE1015	Slide knob (B)(BALANCE) (BLACK)
		AAE1017	Slide knob (B)(BALANCE) (SILVER)
	12	AAY-161	Push knob (LOUDNESS/ ADAPTOR/TAPE 2)
	13	AAY-161	Push knob (SPEAKERS) (BLACK)
		AAD1038	Push knob (SPEAKERS) (SILVER)
	14	ANE1012	Bonnet case (BLACK)
		ANE1013	Bonnet case (SILVER)
	15	ANB1016	Front panel (BLACK)
		ANB1020	Front panel (SILVER)
	16	AMB1029	Panel base (BLACK)
		AMB1045	Panel base (SILVER)
	17	AAK1048	Sheet panel (A)(BLACK)
		AAK1063	Sheet panel (A)(SILVER)
	18	AAK1049	Sheet panel B
	19	AMR1033	Slide knob assembly (BLACK)
		AMR1034	Slide knob assembly (SILVER)
	20	ABH-155	Coil spring
	21	AEC-471	Nylon rivet
	22	AEC-818	Mica sheet
	23	ABA-258	Screw
⚠	24	ADG-068	AC power cord
	25	BBZ30P080FZK	Screw
	26	PMZ20P030FZK	Screw
	27	VBZ30P060FMC	Screw
	28	VMZ30P060FMC	Screw
⚠ ★★	29	2SC2579(A)	Q1, Q3 Power transistor*
⚠ ★★	30	2SA1104(A)	Q2, Q4 Power transistor*
			*hfe of Q1–Q4 should have the same value.
⚠ ★★	31	ASG-552	Push switch (POWER)
⚠	32	ACG-502	Ceramic capacitor (0.01/AC400V)
	101		Chassis
	102		Blind sheet
	103		Base (GND)
	104		Mount plate
	105		Panel stay
	106		Cus
	107		Speaker switch assembly
	108		Bottom plate
	109		Frame
	110		P.C.B. holder
	111		Heat sink
	112		Rear panel
	113		Terminal (GND)
	114		E-ring
	115		Guide shaft
	116		Slide knob (L)
	117		Slider
	118		Speaker terminal assembly
	119		Cushion
	120		Cushion rubber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A

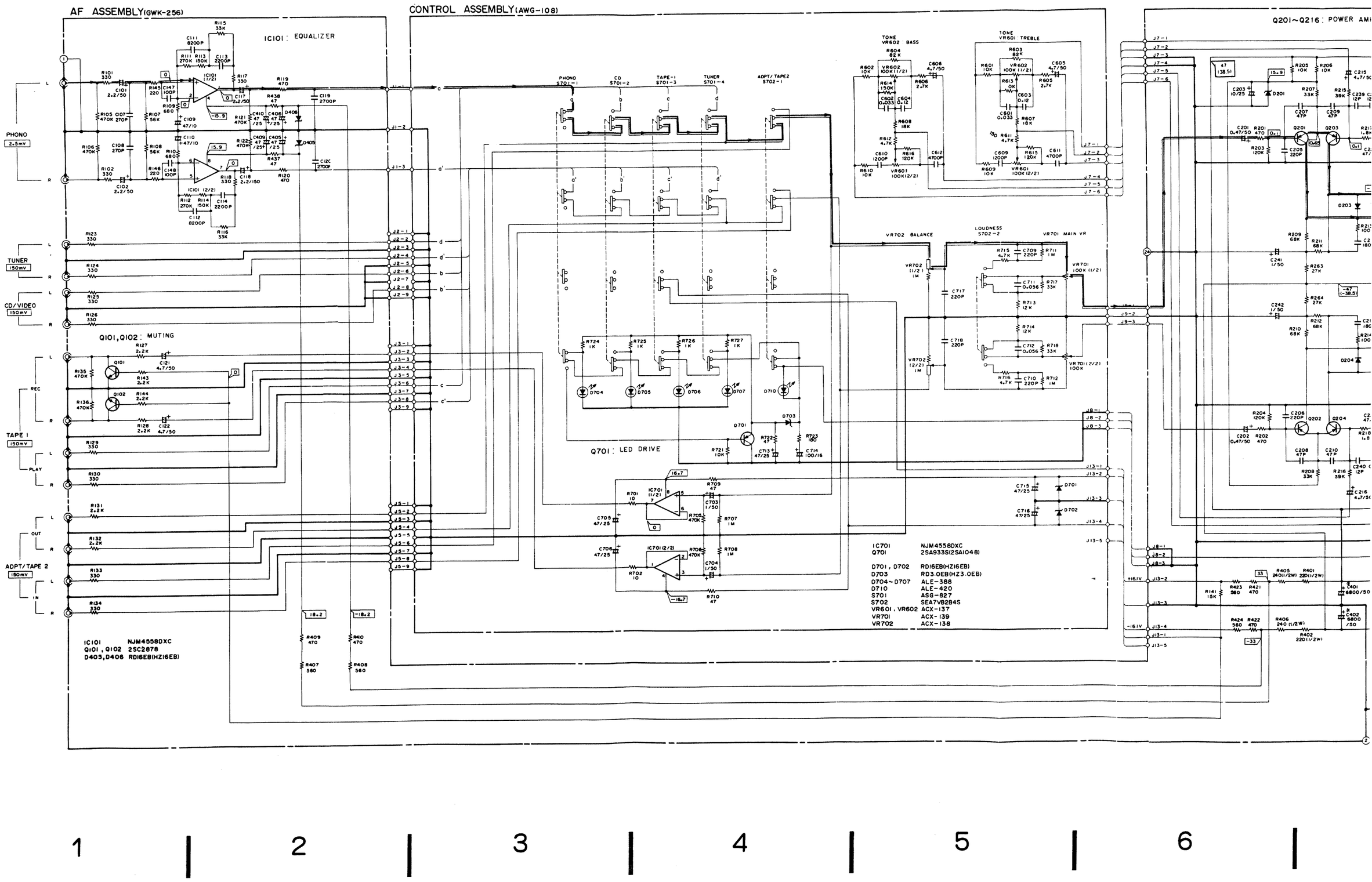
B

C

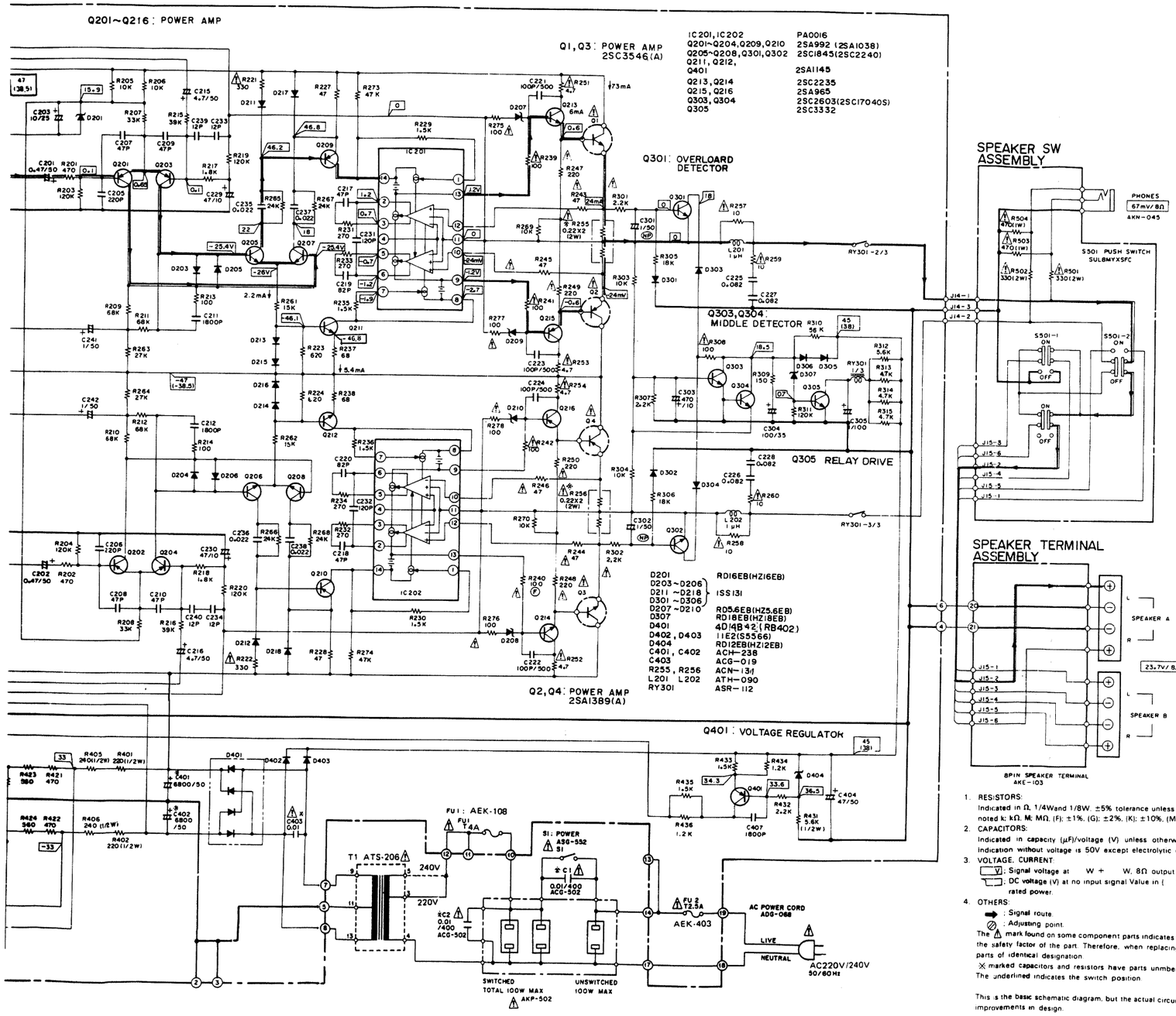
D

1 2 3 4 5 6

7. SCHEMATIC DIAGRAMS



NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



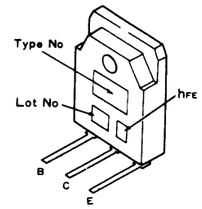
1. RESISTORS:
   Indicated in Ω, 1/4Wand 1/8W. ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance
2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE, CURRENT
   [V]: Signal voltage at W + W, 8Ω output (1 kHz)
   (V): DC voltage (V) at no input signal Value in ( ) is DC voltage at rated power.
4. OTHERS:
   ➡ : Signal route.
   ⊘ : Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ※ marked capacitors and resistors have parts unmbers.
   The underlined indicates the switch position.

   This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

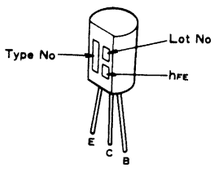
5 SWITCHES:
   S1 POWER (ON, OFF)
   S501 SPEAKERS (A, B, A+B)
   S701-1 FUNCTION (PHONO, CD, TAPE1, TUNER)
   S702-1 ADPT/TAPE 2 (ON, OFF)
   S702-2 LOUDNESS (ON, OFF)

External Appearances of Transistor and ICs

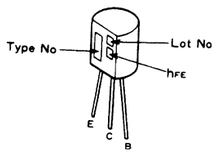
2SA1104 (A)
2SC2579 (A)



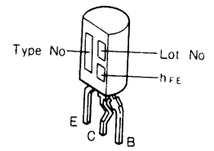
2SA992
2SC1845



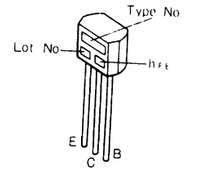
2SA1145
2SC2878



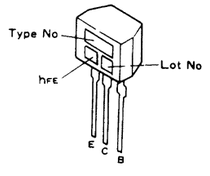
2SC2235 (A)
2SA965 (A)



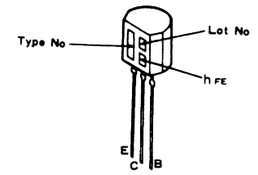
2SC2603



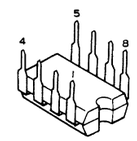
2SC1740S



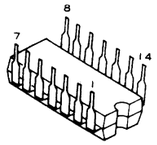
2SC3332



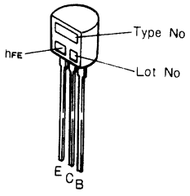
NJM4558DXC



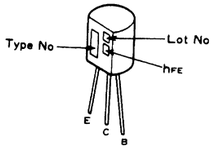
PA0016



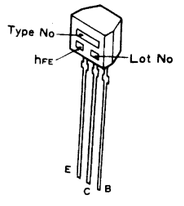
2SA1038
2SC2389



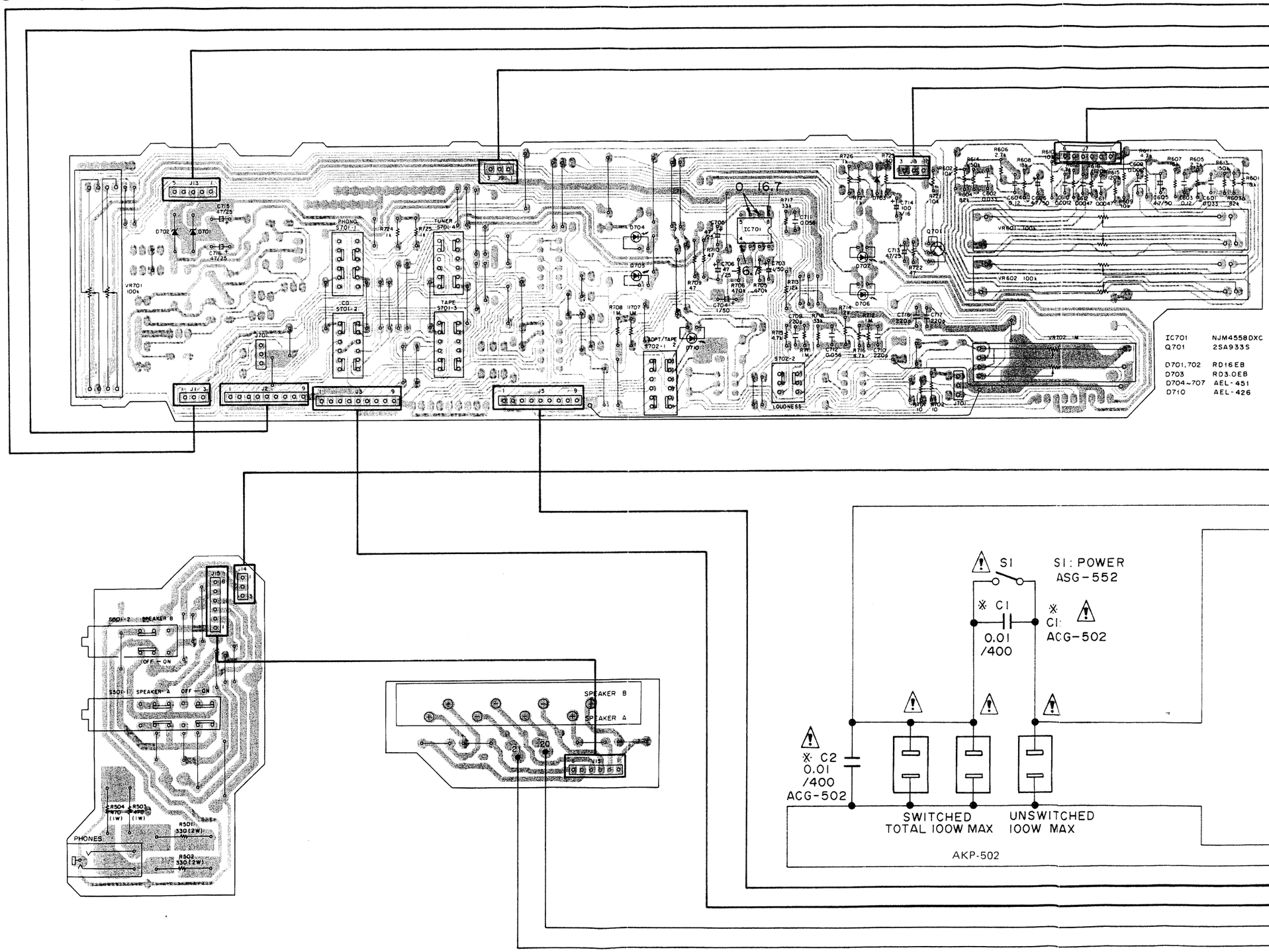
2SA970
2SC2240



2SC2458



6. P.C.BOARDS CONNECTION DIAGRAM



IC101	NJM4558DXC
IC201,202	PA0016
Q101,102	2SC2878
Q201~204,209,210	2SA992
Q205~208,211,212,	
Q301,302	2SC1845
Q401	2SA1145
Q213,214	2SC2235A
Q215,216	2SA965A
Q303,304	2SC2603
Q305	2SC3332
D201,405,406	RD16EB
D203~206,211~218,	
D301~306	1SS131
D207~210	RD5.6EB
D307	RD18EB
D401	4D4842
D402,403	11E2
D404	RD12EB

AC POWER CORD
ADG-068

AC220V/240V
50/60Hz

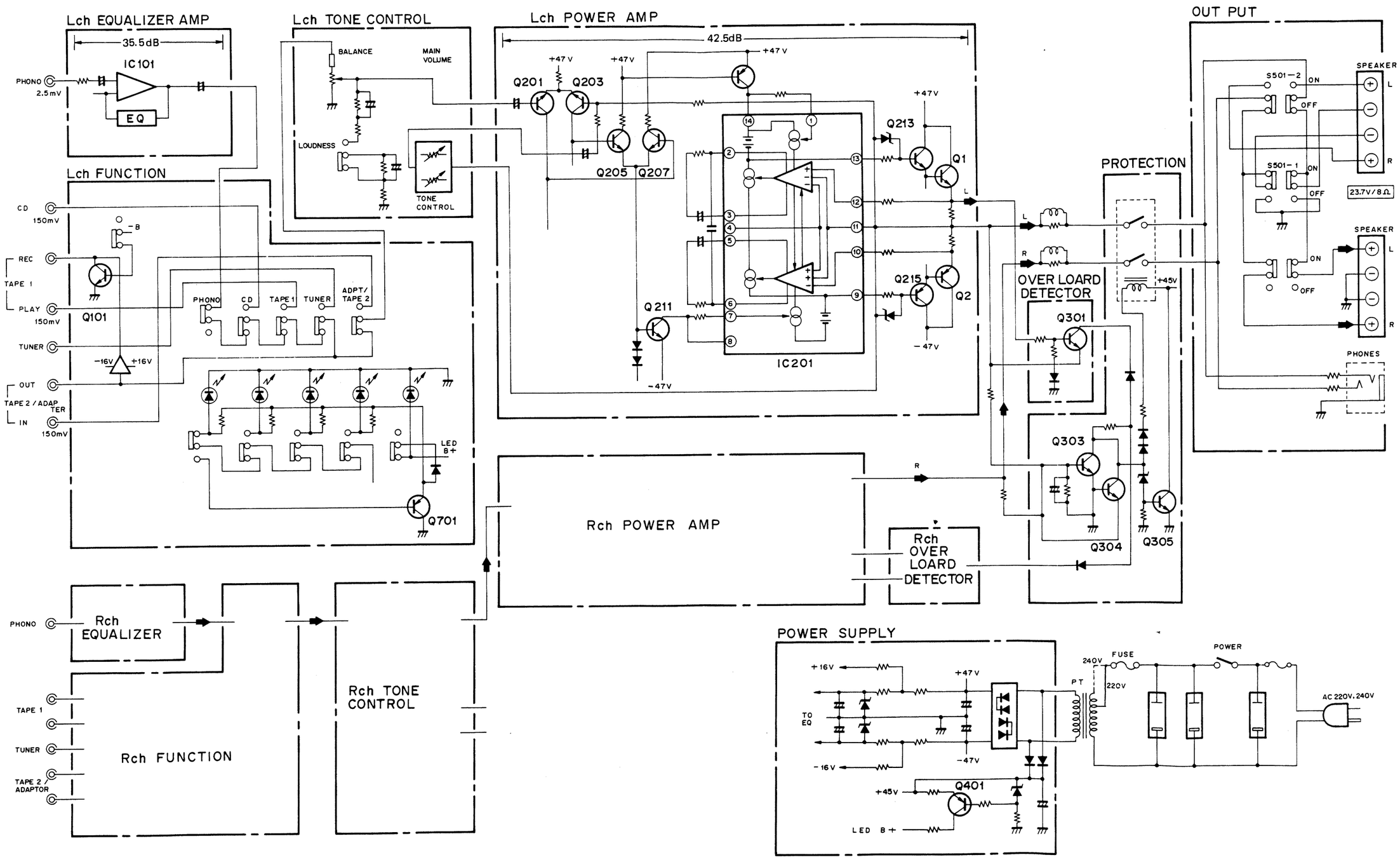
LIVE

NEUTRAL

TI:POWER TRANSFORMER
ATS-206

TAPE 2 / ADAPTOR IN OUT | TAPE 1 PLAY REC | CD/VIDEO | TUNER | PHONO

8. BLOCK DIAGRAM



9. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).*

560Ω	*56 × 10¹*	*561*	*RD¼PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD¼PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

  Ex. 2 *When there are 3 effective digits (such as in high precision metal film resistors).*

5.62kΩ	*562 × 10¹*	*5621*	*RN¼SR 5 6 2 1 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Miscellaneous Parts List

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	AF Assembly	GWK-256
	Control Assembly	AWG-108
	Speaker Switch Assembly	non supply
	Speaker Terminal Assembly	non supply

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
⚠ ★★	Q2, Q4	2SA1104 (A) O/P/Y*
⚠ ★★	Q1, Q3	2SC2579 (A) O/P/Y *

* hfe of Q1 – Q4 should have the same value.

OTHERS

Mark	Symbol & Description	Part No.
⚠	C1, C2 Ceramic capacitor (0.01/AC400V)	ACG-502
⚠ ★	T1 Power transformer (AC220V/240V)	ATS-206
⚠	AC Socket (AC OUTLETS)	AKP-502
⚠ ★★	FU1 Fuse (4A)	AEK-108
⚠ ★★	FU2 Fuse ( )	AEK-403
⚠	AC power cord	ADG-068
⚠ ★★	S1 Push switch (POWER)	ASG-552

AF Assembly (GWK-256)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC101	NJM4558DXC
★★	IC201, IC202	PA0016
★★	Q401	2SA1145
★★	Q215, Q216	2SA965(A)
★★	Q201–Q204, Q209, Q210	2SA992 (2SA1038) (2SA970)
★★	Q209, Q210	2SA992
★★	Q211, Q212, Q205 – Q208, Q301, Q302	2SC1845 (2SC2240) (2SC2389)
★★	Q213, Q214	2SC2235(A)
★★	Q303, Q304	2SC2603 (2SC1740S) (2SC2458)
★★	Q101, Q102	2SC2878
★★	Q305	2SC3332
★	D401	4D4B42 (RB402)
★	D404	RD12EB (HZ12EB)
★	D201, D405, D406	RD16EB (HZ16EB)
★	D307	RD18EB (HZ18EB)
★	D207 – D210	RD5.6EB (HZ5.6EB)
★	D203 – D206, D211 – D218, D301 – D306	1SS131
★	D402, D403	11E2 (S5566)

RELAY

Mark	Symbol & Description	Part No.
★★	RY301 Relay	ASR-111 (ASR-112)

COIL

Mark	Symbol & Description	Part No.
	L201, L202 Inductor (1μH)	ATH-090

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C403 Ceramic capacitor	ACG-019
	C401, C402 (6800/50V)	ACH-283
	C147, C148	CCCSL101J50 (CCDSL101J50)
	C221 – C224	CCCSL101K500 (CCDSL101K500)
	C233, C234, C239, C240	CCCSL120J50 (CCDSL120J50)
	C231, C232	CCCSL121J50
	C205, C206	CCCSL221J50 (CCDSL221J50)
	C107, C108	CCCSL271J50 (CCDSL271J50)
	C207 – C210, C217, C218	CCCSL470J50 (CCDSL470J50)
	C219, C220	CCCSL820J50 (CCDSL820J50)
	C101, C102	CEANL2R2M50
	C301, C302	CEANP010M50
	C201, C202	CEASR47M50
	C305	CEAS010M100
	C241, C242	CEAS010M50
	C203	CEAS100M25
	C304	CEAS101M35
	C117, C118	CEAS2R2M50
	C121, C122, C215, C216	CEAS4R7M50
	C109, C110, C229, C230	CEAS470M10
	C405, C406, C409, C410	CEAS470M25
	C404	CEAS470M50
	C303	CEAS471M10
	C211, C212, C407	CKCYB182K50 (CKDYB182K50)
	C235 – C238	CKCYF223Z50 (CKDYF223Z50)
	C113, C114	CQMA222J50
	C119, C120	CQMA272K50 (CQMA272J50)
	C111, C112	CQMA822J50
	C225 – C228	CQMA823K50 (CQMA823J50)

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
⚠	R255, R256 (0.22Ω × 2)	ACN-131
	R401, R402, R405, R406, R431	RD1/2PM □□□J
⚠	R257 – R260, R301, R302	RD1/4PMFL □□□J
⚠	R221, R222, R239–R254, R275–R278, R308	RFA1/4PS □□□J
	R205–R208, R261–R270, R273, R274, R303–R306, R309, R312–R315, R407–R410, R421–R424, R432–R436	RD1/4PM □□□J
	Other resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal (4P) (TAPE1, ADAPTOR/TAPE2)	AKB-094
	Terminal (6P) (INPUT)	AKB-095
	Transistor socket	AKH-017

Speaker Switch Assembly

SWITCH

Mark	Symbol & Description	Part No.
★★	S501 Push switch (SPEAKERS)	SUL8MYXSC

RESISTORS

Mark	Symbol & Description	Part No.
⚠	R503, R504	RS1PMF471J
⚠	R501, R502	RS2LMF331J

OTHERS

Mark	Symbol & Description	Part No.
	Jack (PHONES)	AKN-045

Speaker Terminal Assembly

OTHERS

Mark	Symbol & Description	Part No.
	Terminal (SPEAKERS)(8P)	AKE-103

Control Assembly (AWG-108)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC701	NJM4558DXC
★★	Q701	2SA933S (2SA1048)
★	D704 – D707	AEL-451
★	D710	AEL-426
★	D701, D702	RD16EB (HZ16EB)
★	D703	RD3.0EB (HZ3.0EB)

SWITCHES

Mark	Symbol & Description	Part No.
★★	S701 Push switch (FUNCTION)	ASG-827
★★	S702 Push switch (ADAPTOR/ TAPE2 LOUDNESS)	SEA7VB2B4S

CAPACITORS

Mark	Symbol & Description	Part No.
	C709, C710, C717, C718	CCCSL221J50 (CCDSL221J50)
	C703, C704	CEAS010M50
	C714	CEAS101M16
	C605, C606	CEAS4R7M50
	C705, C706, C713, C715, C716	CEAS470M25
	C609, C610	CQMA122K50
	C603, C604	CQMA124K50
	C601, C602	CQMA333K50
	C611, C612	CQMA472K50
	C711, C712	CQMA563K50

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★★	VR601, VR602 (TREBLE, BASS)	ACX-137
★★	VR702 (BALANCE)	ACX-138
★★	VR701 (MAIN)	ACX-139
	R601, R602, R609, R610, R709, R710	RD1/4PM □□□J
	Other resistors	RD1/8PM □□□J